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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/804,314	03/19/2004	Matthijs H. Keuper	LUM-03-06-09 US	7327

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EXAMINER

DICKEY, THOMAS L

ART UNIT PAPER NUMBER

2826

DATE MAILED: 06/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/804,314

Applicant(s)

KEUPER ET AL.

Examiner

Thomas L. Dickey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21,23-35 and 71-78 is/are pending in the application.
- 4a) Of the above claim(s) 8-17,25-31,35,77 and 78 is/are withdrawn from consideration.
- 5) ☐ Claim(s) 24 is/are allowed.
- 6) ☒ Claim(s) 1-7,18-21,23,32-34 and 71-76 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Minhloan Tran
Minhloan Tran
Primary Examiner
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Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

1. The amendment filed on 03/15/06 has been entered.

Terminal Disclaimer

2. The terminal disclaimer filed on 03/15/2006 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of pending reference Application Number 10/805,424, filed on March 19, 2004, has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 18,32,33,71, and 72 are rejected under 35 U.S.C. 102(b) as being anticipated by WEBER ET AL. (6,364,487).

Weber et al. discloses a backlight LCD with a first light-emitting diode (source 81 includes at least one LED, note column 4 line 51) including an epitaxial structure comprising an active region sandwiched between an n-type region and a p-type region, the active region configured to emit light when forward biased (note that Niwa et al.

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2002/0031153 teaches that it is an inherent property of all LEDs to have an epitaxial structure comprising an active region sandwiched between an n-type region and a p-type region, configured to emit light when forward biased) that emits light; a non-absorbing polarizer 83-84 coupled to the light-emitting diode 81, the non-absorbing polarizer 83-84 transmitting light having a desired polarization orientation and reflecting light that does not have the desired polarization orientation; a randomizing element (described at column 4 lines 55-60) coupled to the active region and the non-absorbing polarizer 83-84, the randomizing element positioned to receive light emitted from the light-emitting diode 81 and reflected from the non-absorbing polarizer 83-84, the randomizing element at least partially randomizes the polarization state of the light; a Compound Parabolic Concentrator 82 which functions to configure (in the same way as the Compound Parabolic Concentrator applicants describe at paragraph 0056 of the specification serves to configure applicants' polarizer/randomizer to preserve overall radiance) the non-absorbing polarizer 83-84 and randomizing element to preserve the overall radiance of the light transmitted by the non-absorbing polarizer 83-84 with respect to the light emitted when the active region is forward biased; and a polarized microdisplay (described, with regard to the figure 3 device, at column 4 line 54. In an alternate embodiment Weber et al. show a polarized microdisplay as part 74 of figure 2) disposed in a path of light transmitted by the non-absorbing polarizer 83-84. Note figures 2 and 3 and column 4 lines 40-67 of Weber et al.

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Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

A. Claims 19-22,73, and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over WEBER ET AL. (6,364,487) in view of WEINDORF ET AL. (2002/0140880).

Weber et al. discloses a backlight LCD with all the limitations of claims 19-21,73, and 74 except that the non-absorbing polarizer is a wire grid polarizer and the randomizing element is a wavelength converting material (phosphor) disposed between the non-absorbing polarizer and the active region, or with regard to claim 23, that the device further comprise a substrate having a roughened surface disposed between the non-absorbing polarizer and the active region. Note figures 2 and 3 and column 4 lines 40-67 of Weber et al.

However, Weindorf et al. discloses a wire grid polarizer non-absorbing polarizer 106 coupled to a first light-emitting diode 126, the non-absorbing polarizer 106 transmitting light having a desired polarization orientation and reflecting light that does not have the desired polarization orientation; a randomizing element 130 coupled to the first light-emitting diode 126 and the non-absorbing polarizer 106, the randomizing element 130

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positioned to receive light emitted from the first light-emitting diode 126 and reflected from the non-absorbing polarizer 106, the randomizing element 130 at least partially randomizes the polarization state of the light, and a polarized microdisplay 104 disposed in a path of light transmitted by the non-absorbing polarizer 106. With particular regard to claims 20, 21, and 74 Weindorf et al. discloses that the randomizing element 130 is a phosphor wavelength converting material 130 disposed between the non-absorbing polarizer 106 and the active region. Note figures 1 and 2 and paragraphs 0029-0041 of Weindorf et al. With particular regard to claim 23 Weindorf et al. discloses a substrate 108 (said substrate is not part of the LED comprising the active region) having a roughened surface (described at paragraph 0033 as a "diffuse" surface, where it is stated, "The diffuse surface of the diffuser 108 scrambles the polarization of the light and reflects a significant portion of the light back towards the reflective polarizer") disposed between the non-absorbing polarizer 106 and the active region. Therefore, it would have been obvious to a person having skill in the art to augment Weber et al.'s backlight LCD with the wire grid non-absorbing polarizer and wavelength converting material (phosphor) disposed between the non-absorbing polarizer and the active region such as taught by Weindorf et al. in order to fully enable the polarized microdisplay, of which Weber et al. only sketches out the fundamentals.

B. Claims 34, 75, and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over WEBER ET AL. (6,364,487) in view of WEBER ET AL. (2001/0036083).

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Weber et al. '487 discloses a backlight LCD with all the limitations of claims 71 and 32, from which claims 76 and 34 ultimately depend. See above. In addition, Weber et al. '487 discloses a second light-emitting diode (inside source 80) including an epitaxial structure comprising an active region sandwiched between a second n-type region and a second p-type region, that emits light when forward biased; a second randomizing element coupled to the second light-emitting diode and the second non-absorbing polarizer, the second randomizing element positioned to receive light emitted from the second light-emitting diode and the second non-absorbing polarizer, the second randomizing element at least partially randomizes the polarization state of the light; and a light-combining element disposed in the path of the light emitted by the first light-emitting diode and then transmitted by the non-absorbing polarizer and the path of the light emitted by the second light-emitting diode and transmitted by the second non-absorbing polarizer, wherein the light-combining element combines the light emitted by the first light-emitting diode and then transmitted by the non-absorbing polarizer and the light emitted by the second light-emitting diode and transmitted by the second non-absorbing polarizer; wherein the microdisplay receives the combined light from the light-combining element. Note figures 2 and 3 and column 4 lines 40-67 of Weber et al. '487

Weber et al. '487 does not disclose a second non-absorbing polarizer coupled to the second light-emitting diode and transmitting light having a second polarization orientation that is orthogonal to the polarization orientation of the light transmitted by the non-absorbing polarizer, and reflecting light that does not have the second polarization

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orientation; that light-combining element (which combines the light emitted by the first and second LEDs) is a polarizing beamsplitter.

However, Weber et al. '083 discloses a highly efficient light-combining element which derives its efficiency from its ability, by combining two or more non-absorbing polarizers 54 coupled to light-emitting diodes c1 through cn-1, the non-absorbing polarizers 54 transmitting light having polarizations orientation that are orthogonal to each other with a polarizing beamsplitter 55, to combine light having a first polarization orientation and light having a second, orthogonal polarization orientation. Note figure 1 and paragraph 0015 of Weber et al. '083 Therefore, it would have been obvious to a person having skill in the art to replace the light-combining element of Weber et al. '487's backlight LCD with the polarizing beamsplitter such as taught by Weber et al. '083 in order to increase the efficiency with which polarized light is delivered to a polarized microdisplay to thus provide a brighter display.

C. Claims 1-5 stand rejected under 35 U.S.C. 103(a) as being unpatentable over NIWA et al. (2002/0031153) in view of WEINDORF ET AL. (2002/0140880).

Niwa et al. discloses a system comprising a first light emitting diode having an epitaxial structure comprising an active region 6 comprising at least one layer of (1,1,-2,0) or (1,0,-1,0) InGaN sandwiched between an n-type region 5 and a p-type region 7, the active region 6 configured to emit light that is at least 50%, in fact at least 80%, polarized along a first polarization orientation when forward biased. Note figures 6A-C, 14, 15, and paragraphs 0113-0123 and 0172-0187 of Niwa et al. Niwa et al. does not

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disclose a polarized microdisplay disposed in a path of light emitted by the active region from the first light emitting device.

However, Weindorf et al. discloses a backlight LCD with a polarized microdisplay 104 disposed in a path of light emitted by an active region from a first light-emitting device 126. Note figures 1 and 2 and paragraphs 0029-0041 of Weindorf et al.

Therefore, it would have been obvious to a person having skill in the art to insert Niwa et al.'s LED into the polarized microdisplay such as taught by Weindorf et al. in order to use Niwa et al.'s LED in a useful device. Since Weindorf et al. teaches that backlight LCDs are presently being used in hundreds of millions of consumer devices, from telephones to toasters to televisions, that are sold for billions of dollars annually, one would have been motivated to do this because even the slightest commercial advantage that might accrue from this substitution could produce a vast income.

D. Claims 6 and 7 stand rejected under 35 U.S.C. 103(a) as being unpatentable over NIWA et al. (2002/0031153) in view of WEINDORF ET AL. (2002/0140880), as applied to claim 1 above, and further in view of WEBER ET AL. (2001/0036083).

Niwa et al. and Weindorf et al. suggest a backlight LCD with all the limitations of claim 1, from which claims 6 and 7 ultimately depend. See above. In addition, Weindorf et al. discloses a second light-emitting diode 126 (note that all of Weindorf et al.'s LEDs are labeled 126 in the figures) including an epitaxial structure comprising an active region sandwiched between a second n-type region and a second p-type region, that emits light when forward biased; a second randomizing element 130 coupled to the

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second light-emitting diode 126 and the second non-absorbing polarizer 106, the second randomizing element 130 positioned to receive light emitted from the second light-emitting diode 126 and the second non-absorbing polarizer 106, the second randomizing element 130 at least partially randomizes the polarization state of the light; and a light-combining element 110 disposed in the path of the light emitted by the first light-emitting diode 126 and then transmitted by the non-absorbing polarizer 106 and the path of the light emitted by the second light-emitting diode 126 and transmitted by the second non-absorbing polarizer 106, wherein the light-combining element 110 combines the light emitted by the first light-emitting diode 126 and then transmitted by the non-absorbing polarizer 106 and the light emitted by the second light-emitting diode 126 and transmitted by the second non-absorbing polarizer 106; wherein the microdisplay 104 receives the combined light from the light-combining element 110.

Note figures 1 and 2 and paragraphs 0029-0041 of Weindorf et al. Note figures 6A-C, 14, 15, and paragraphs 0113-0123 and 0172-0187 of Niwa et al. Niwa et al. and Weindorf et al. do not disclose a second non-absorbing polarizer coupled to the second light-emitting diode and transmitting light having a second polarization orientation that is orthogonal to the polarization orientation of the light transmitted by the non-absorbing polarizer, and reflecting light that does not have the second polarization orientation; that light-combining element 110 (which combines the light emitted by the first and second LEDs) is a polarizing beamsplitter.

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However, Weber et al. discloses a highly efficient light-combining element which derives its efficiency from its ability, by combining two or more non-absorbing polarizers 54 coupled to light-emitting diodes c1 through cn-1, the non-absorbing polarizers 54 transmitting light having polarizations orientation that are orthogonal to each other with a polarizing beamsplitter 55, to combine light having a first polarization orientation and light having a second, orthogonal polarization orientation. Note figure 1 and paragraph 0015 of Weber et al. Therefore, it would have been obvious to a person having skill in the art to replace the light-combining element of Weindorf et al.'s backlight LCD with the polarizing beamsplitter such as taught by Weber et al. in order to increase the efficiency with which polarized light is delivered to a polarized microdisplay to thus provide a brighter display.

Allowable Subject Matter

5. Claim 24 is allowed over the references of record because none of these references disclosed or can be combined to yield the claimed invention such as an apparatus comprising an epitaxial structure comprising an active region sandwiched between an n-type region and a p-type region, the active region configured to emit light when forward biased; a non-absorbing polarizer coupled to the active region, the non-absorbing polarizer transmitting light having a desired polarization orientation and reflecting light that does not have the desired polarization orientation; and a randomizing element coupled to the active region and the non-absorbing polarizer, the randomizing element positioned to receive light emitted from the active region and reflected from the non-

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absorbing polarizer, the randomizing element at least partially randomizes the polarization state of the light; wherein the randomizing element is a birefringent material, as recited in claim 24.

Response to Arguments

6. Applicant's arguments with respect to claims 18-21, 23, 25-35, and 71-78 have been considered but are moot in view of the new ground(s) of rejection.

7. With regard to the remaining claims, Applicant's arguments filed 03/15/06 have been fully considered but they are not persuasive.

It is argued, at page 13 of the remarks that "Claim 1 is now in condition for allowance." However, this is a conclusory statement, for which Applicant supplies no evidence.

It is argued, at page 13 of the remarks, that "Moreover, Applicant notes that Niwa discloses a 'semiconductor laser device' not a light emitting diode as recited in Claim 1. See Niwa paragraph 0037." Niwa et al. do in fact make the statement, "which device is typically configured as a semiconductor laser device," in paragraph 0037. However the Examiner notes that in paragraph 0041 Niwa et al. go on to state, "As the semiconductor light emitting device allowing blue based light, blue-violet based light and ultraviolet based light, there may be used not only a semiconductor laser device, but also a semiconductor device having a hetero junction such as pn-junction or pin-junction and allowing light emission, for example, a light emitting diode device or super

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luminescent diode device." (Emphasis added) Less than 300 words separate these two statements, yet Applicant was able to locate and cite only the one supporting (and not the one refuting) Applicant's argument.

On page 12, with regard to claim 23, it is argued that "The Examiner objected to Claims 23 and 24 as being dependent upon a rejected base claim, but indicated that they would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. Claims 23 and 24 have been so amended." With regard to claim 23, Applicant's statement is untrue. Claim 23 has been re-written into a form that removes a critical limitation from said claim. The version of claim 23 that was indicated allowable required the presence of an LED comprising a substrate, and further required that the surface of the substrate of the LED be roughened. On 3/15/06 Applicant amended claim 23 to remove the requirement of said LED comprising a substrate, and to remove the requirement that the surface of said substrate of said LED be roughened.

Applicant is free to amend his claims however he likes. The examiner objects, however, to Applicant's amending a claim to broaden it, and then asserting that he has amended that claim to remove an objection to form. Generally speaking is it the Examiner's policy to write an action on the assumption that facts each Applicant asserts are true are in fact true. When the Examiner discovers a particular Applicant's version of the facts to be untrue, the Examiner finds himself required to undo work he has

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completed, and start again from the beginning. This is a waste of the Examiner's time, and of the Office's resources.

Conclusion

8. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

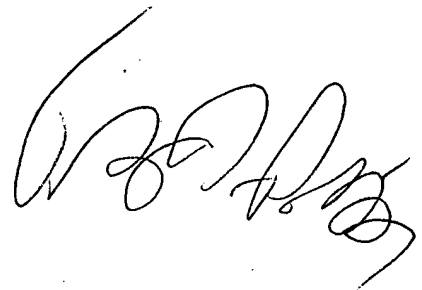
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas L Dickey whose telephone number is 571-272-1913. The examiner can normally be reached on Monday-Thursday 8-6.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thomas L. Dickey
Patent Examiner
Art Unit 2826
05/06